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SAFE PESTICIDE USE

CAN IMPROVE BUSINESS SUCCESS

by

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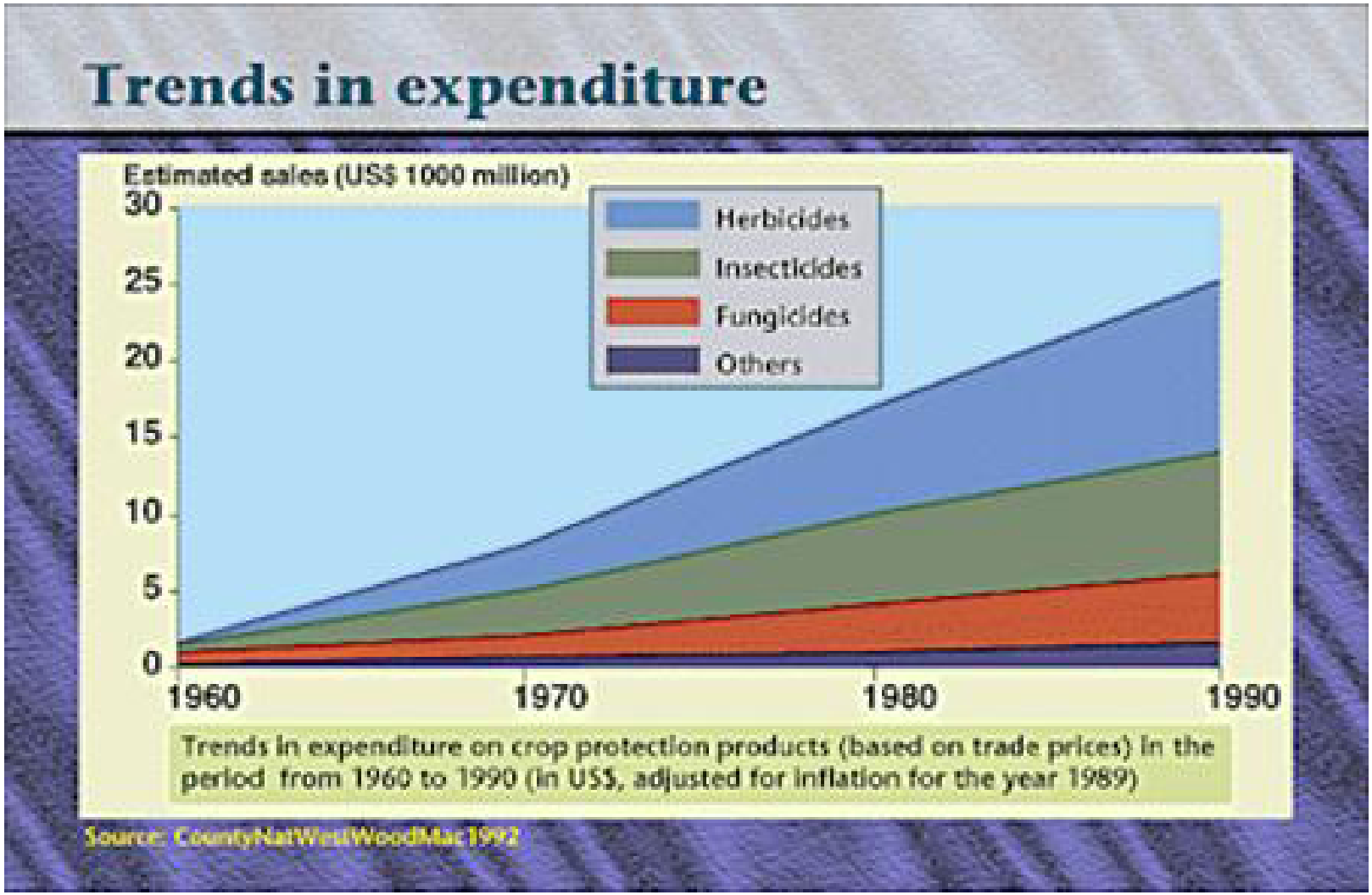
In 1996, the global pesticide market was valued at US$30.5 Billion



Disease Management and Control

There are two primary methods of managing a plant disease:

- Preventing the disease from developing,
- Suppressing the disease after it has occurred

Pest Control

- **Control a pest only when it is causing or is expected to cause more harm than is reasonable to accept.**
- **Use a control strategy that will reduce the pest numbers to an acceptable level.**
- **Cause as little harm as possible to everything except the pest.**

Pest Control Goals

- Prevention -- keeping a pest from becoming a problem,
- Suppression -- reducing pest numbers or damage to an acceptable level,
- Eradication -- destroying an entire pest population .

Threshold Levels

- ***Thresholds may be based on esthetic, health, or economic considerations. These levels, which are known as "action thresholds," have been determined for many pests***

Pesticides are applied each year

- **Worldwide, about 3 billion kg of pesticides are applied each year with a purchase price of nearly $40 billion per year**

  (Pan-UK, 2003)

- **In the U.S., approximately 500 million kg of more than 600 different pesticide types are applied annually at a cost of $10 billion**

  (Pimentel and Greiner, 1997).

Despite the widespread application of pesticides in the United States

At recommended dosages, pests (insects, plant pathogens, and weeds) destroy 37% of all potential crops (Pimentel, 1997).

1. Insects destroy 13%,
2. plant pathogens 12%
3. weeds 12%.

In general, each dollar invested in pesticide control returns about $4 in protected crops\

(Pimentel, 1997)

- Most benefits of pesticides are based only on the direct crop returns.
- Such assessments do not include the indirect environment and economic costs associated with the recommended application of pesticides in crops
- U.S. Environmental Protection Agency pointed out the need for such a benefit/cost and risk investigation (EPA, 1977)

ENVIRONMENTAL AND ECONOMIC COSTS

Costs Millions of	$/year
Public health impacts	1,140
Domestic animals deaths and contaminations	30
Loss of natural enemies	520
Cost of pesticide resistance	1,500
Honeybee and pollination losses	334
Crop losses	1,391
Fishery losses	100
Bird losses	2,160
Groundwater contamination	2,000
Government regulations to prevent damage	470
TOTAL	9,645

Public health effects

1. **ACUTE POISONINGS**
2. **CANCER AND OTHER CHRONIC EFFECTS**
3. **PESTICIDE RESIDUES IN FOOD**

ACUTE POISONINGS

- **Human pesticide poisonings and illnesses are clearly the highest price paid for all pesticide use.**
- **The total number of pesticide poisonings in the United States is estimated to be 300,000 per year (EPA, 1992).**
- **Worldwide, the application of 3 million metric tons of pestcides results in more than 26 million cases of non-fatal pesticide poisonings (Richter, 2002).**
- **Of the pesticide poisonings, about 3 million cases are hospitalized and there are approximately 220,000 deaths and about 750,000 chronic illnesses every year (Hart and Pimentel, 2002).**

CANCER AND OTHER CHRONIC EFFECTS

These major types of chronic health effects of pesticides include

1. **neurological effects,**
2. **respiratory**
3. **reproductive effects**
4. **cancer.**

- Incidence of cancer in U.S. due to pesticides:10,000 to 15,000 cases per year (Pimentel et al., 1997).

- Latino farm workers have a higher cancer rate. If everyone in the U.S. had a similar rate, there would be 83,000 more cases of cancer associated with pesticides (UFW 2003)

- According to the EPA, babies and toddlers are 10 times more at risk for cancer than adults (Hebert, 2003).

- 40% of workers in California agricultural fields had blood cholinesterase levels below normal, a strong indication of organophosphate and carbamate pesticide poisoning (Repetto and Baliga, 1996).

- Assuming that pesticide-induced cancers number more than 10,000 cases per year and that pesticides return a net agricultural benefit of $32 billion per year, each case of cancer is "worth" $3.2 million in pest control.
- In other words, for every $3.2 million in pesticide benefits, one person falls victim to cancer.

Domestic animal poisonings

1. 250,000 poison cases—mostly due to pesticides—involving animals
2. Costs of $21.3 and $8.8 million, due to animal illness and death, are lost to pesticide poisonings

Pesticide resistance

- **Pesticide resistance ranks as one of the top 4 environmental problems of the world (UNEP, 1979)**

- **52 insect & mite species, 150 plant pathogen species, and 273 weeds species are now resistant to pesticides (Stuart, 2003)**

Honeybee

- **20% of all honeybee colonies are adversely affected by pesticides (Mayer 1990)**

- **5% of U.S. honeybee colonies are killed during winter because of pesticide exposure**

Crops are damaged by the pesticide treatments

(1) the recommended dosages often suppress crop growth, development, and yield;

(2) pesticides drift from the targeted crop to damage adjacent crops;

(3) Herbicide residues prevent chemical-sensitive crops from being planted;

(4) excessive pesticide residue accumulates on crops, necessitating the destruction of the harvest

Ground and surface water contamination

- **Estimates are that nearly one-half of the groundwater and well water in the United States is or has the potential to be contaminated with pesticides (Holmes et al., 1988; USGS, 1996)**

- **10% of community wells and 4% of rural domestic wells have detectable levels of at least one of the 127 pesticides tested in a national survey (EPA 1990)**

Government funds for pesticide pollution control

- About $10 million spent per year by state and federal governments to train and register pesticide applicators.
- Also, more than $60 million is spent each year by the EPA to register and reregister pesticides.
- In addition, about $400 million is spent to monitor pesticide contamination of fruits, vegetables, grains, meat, milk, water, and other items for pesticide contamination.
- Thus, at least $470 million is invested by state and federal governmental organizations.


Always wash hands and face before eating, drinking or smoking, or going to the toilet.
Wash hands and face before eating, drinking or smoking
After working with pesticides wash thoroughly.


Do not contaminate the environment by mis-use of pesticides.

Drivers should be adequately trained.

- Regulations
- Operating procedures
- Products (properties and hazards)
- Load segregation
- Securing of loads
- Dealing with leakages
- First aid
- Use of safety equipment and protective clothing
- Fire fighting
- Safe driving techniques
- Emergency procedures